

Claims

1. A heating device comprising a main housing (4) defining a combustion chamber (6) within which fuel gas is converted to heat for heating the main housing (4), an exhaust gas port (15) from the combustion chamber (6) for exhausting burnt gases therefrom, a working body member (5) of heat conductive material in heat conducting engagement with the main housing (4) for receiving heat therefrom, and a passageway (33) extending from the exhaust gas port (15) to an exhaust gas outlet (34) past the working body member (5) for accommodating exhaust gases from the exhaust gas port (15) to the exhaust gas outlet (34) for transferring heat from the exhaust gases to the working body member (5), characterised in that a heat exchange means (45,46) comprising a plurality of spaced apart heat exchange fins (45, 46) extend from the working body member (5) into the passageway for transferring heat from the exhaust gases to the working body member (5) for reducing the temperature at which the exhaust gases exit from the heating device (3) through the exhaust gas outlet (34), and the heat exchange fins define a circuitous exhaust gas passageway (33) through which the exhaust gases pass between the exhaust gas port (15) and the exhaust gas outlet (33).
2. A heating device as claimed in Claim 1 characterised in that the heat exchange fins (45,46) extend from the working body member (5) in a staggered formation for forming the circuitous exhaust gas passageway (33).
3. A heating device as claimed in any of Claims 1 or 2 characterised in that the heat exchange fins (45,46) are parallel or inclined to each other.
4. A heating device as claimed in any preceding claim characterised in that a cover (30) is provided around the working body member (5) adjacent the heat exchange fins (45,46) for defining with the working body member (5) and the heat exchange fins (45,46), the exhaust gas passageway (33).
5. A heating device as claimed in any preceding claim characterised in that the heat exchange fins (45,46) extend on respective opposite sides of the working body

member (5) for defining a pair of passageways (33) extending on both sides of the working body member (5).

6. A heating device as claimed in Claim 5 characterised in that the respective 5 passageways (33) merge adjacent the exhaust gas port (15) and adjacent the exhaust gas outlet (34).
7. A heating device as claimed in any preceding claim characterised in that the main housing (4) is an elongated main housing defining an elongated combustion 10 chamber (6) extending from an upstream end (7) to a downstream end (8), the exhaust gas port (15) being located adjacent the downstream end (8), the heat exchange fins (45,46) being located on the working body member (5) adjacent the downstream end (8) of the main housing (4).
- 15 8. A heating device as claimed in Claim 7 characterised in that the working body member (5) extends longitudinally along the main housing (4) from the upstream end (7) to the downstream end (8) thereof.
9. A heating device as claimed in Claim 8 characterised in that a portion (25) of 20 the working body member (5) extends in a downstream direction beyond the downstream end (8) of the main housing (4), and the heat exchange fins (45,46) are located adjacent the portion (25) of the working body member (5) extending downstream beyond the working body member (5).
- 25 10. A heating device as claimed in any preceding claim characterised in that the working body member (5) defines a heating chamber (20) for receiving and melting hot melt glue therein, and a dispensing nozzle (25) extends from the working body member (5) communicating with the heating chamber (20) for receiving and dispensing melted glue therefrom.
- 30 11. A heating device as claimed in Claim 10 characterised in that the heating chamber (20) is an elongated heating chamber (20) extending between an upstream

end (21) and a downstream end (22), the dispensing nozzle (25) extending in a generally downstream direction from the downstream end (22) of the working body member (5).

5 12. A heating device as claimed in Claim 10 or 11 characterised in that the heat exchange fins (45,46) are located adjacent the dispensing nozzle (25).

13. A heating device as claimed in Claim 12 characterised in that the heat exchange fins (45,46) extend transversely from the dispensing nozzle (25) on 10 respective opposite sides thereof in an upstream/downstream direction relative to the heating chamber (20).

14. A heating device as claimed in any of Claims 10 to 13 characterised in that the dispensing nozzle (25) extends axially from the working body member (5) 15 relative to the heating chamber (20).

15. A heating device as claimed in Claim 14 characterised in that the dispensing nozzle (25) extends co-axially with the heating chamber (20) from the working body member (5).

20 16. A heating device as claimed in any of Claims 10 to 15 characterised in that a glue receiving inlet (23) is provided at the upstream end (21) of the heating chamber (20) for receiving glue into the heating chamber (20) in an elongated stick form.

25 17. A heating device as claimed in Claim 16 characterised in that the glue receiving inlet (23) receives the glue stick co-axially with the heating chamber (20).

18. A heating device as claimed in any of Claims 10 to 17 characterised in that the working body member (5) is located relative to the main housing (4) so that the 30 heating chamber (20) and the combustion chamber (6) extend parallel to each other.

19. A heating device as claimed in any preceding claim characterised in that a

fuel gas inlet (11) is located at the upstream end (7) of the combustion chamber (6) for receiving fuel gas for converting to heat in the combustion chamber (6).

20. A heating device as claimed in any preceding claim characterised in that a  
5 gas catalytic combustion element (10) is located in the combustion chamber (6) for  
converting fuel gas to heat.
21. A heating device as claimed in any preceding claim characterised in that the  
heat exchange fins (45,46) are adapted for reducing the temperature of the exhaust  
10 gases exiting the exhaust gas outlet (34) to a temperature approximately similar to  
the temperature of the working body member.
22. A heating device as claimed in any preceding claim characterised in that the  
heat exchange fins (45,46) are adapted for reducing the temperature of the exhaust  
15 gases exiting the exhaust gas outlet (34) to a temperature approaching the  
temperature of the working body member.
23. A heating device as claimed in any preceding claim characterised in that the  
heat exchange fins (45,46) are adapted for reducing the temperature of the exhaust  
20 gases exiting the exhaust gas outlet (34) to a temperature just slightly above the  
temperature of the working body member adjacent the heat exchange fins (45, 46).
24. A heating device as claimed in any preceding claim characterised in that the  
heat exchange fins (45,46) are adapted for reducing the temperature of the exhaust  
25 gases exiting the exhaust gas outlet (34) to a temperature not greater than 50°C  
above the temperature of the working body member adjacent the heat exchange fins  
(45, 46).
25. A heating device as claimed in any preceding claim characterised in that the  
heat exchange fins (45,46) are adapted for reducing the temperature of the exhaust  
30 gases exiting the exhaust gas outlet (34) to a temperature not greater than 15°C  
above the temperature of the working body member adjacent the heat exchange fins

(45, 46).

26. A heating device as claimed in any preceding claim characterised in that the heat exchange fins (45,46) are adapted for reducing the temperature of the exhaust gases exiting the exhaust gas outlet (34) to a temperature not greater than 5°C above the temperature of the working body member adjacent the heat exchange fins (45, 46).

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27. A glue gun characterised in that the glue gun (1) comprises the heating device (3) claimed in any preceding claim.

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